

NE-USB USB Communication Sample Program (Linux Python)

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1. Overview

This is an outline of sample programming to control NE-USB via USB communication.

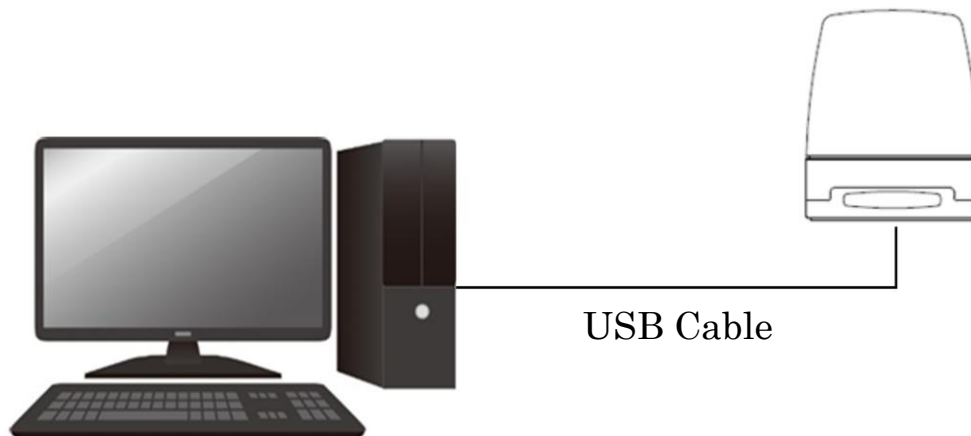
The programs are intended to control the unit using Python without the use of DLLs provided by PATLITE.

This program is only a sample and additional design for abnormalities are necessary.

1.1. System Overview

The system configuration diagram of this program is as follows.

This program controls one NE-USB by USB communication.



2. Development Environment

The development environment of the sample program is shown below.

2.1. Linux Environment

Development Environment		Remarks
Development OS	Ubuntu	Development OS
Development Language	Python	Development Language
Package	PyUSB	Package
Library	libusb	Library

2.1.1. Environment

•Installation of libusb

It is installed as a standard-package in Ubuntu (18.04). If, for some reason, it is not installed, install it with apt-get command.

```
$ sudo apt-get update
$ sudo apt-get install libusb-1.0.0
```

•Installing packages for the Python3 virtual environment

Use apt-get command to create a Python 3 virtual environment.

```
$ sudo apt-get install python3-venv
```

•Creating a Virtual Environment

Create a Python virtual environment so as not to affect the system environment, and install package for USB operation.

Launch Command Prompt, navigate to the working directory, and create a virtual environment.

```
$ python3 -m venv venv
```

Enable virtual environment

```
$ source venv/bin/activate
(venv) $
```

※When the virtual environment is enabled, "(venv)" is displayed at the beginning of the command prompt.

Standard package update

```
(venv) $ python3 -m pip install -U pip setuptools
```

Install the package for USB operation

```
(venv) $ python3 -m pip install pyusb
```

•Execution of the sample program and termination of the virtual environment

Execution of sample program

```
(venv) $ python3 main.py
```

Ending virtual environment

```
(venv) $ deactivate  
$
```

Now, sample programs can be executed by performing "Enable virtual environment".

- When access is denied when executing a sample program

If "usb.core.USBError: [Errno 13] Access denied (insufficient permissions) " is displayed when a sample program is executed, it should be executed with root privilege because there is no access privilege to the USB device.

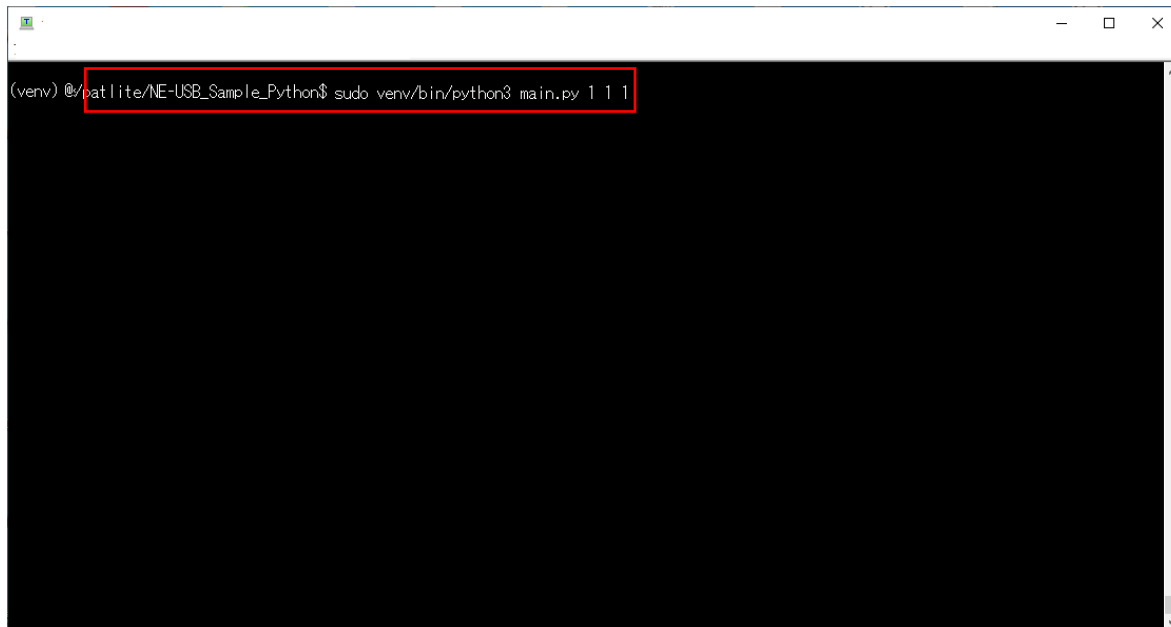
```
(venv) $ sudo venv/bin/python3 main.py
```

※It must be set so user can run sudo

3. Sample Source Overview

3.1. Command Operation

At the Command Prompt, specify the command line arguments to execute commands for each operation.

A screenshot of a terminal window. The prompt is `(venv) @/patlite/NE-USB_Sample_Python$`. The command `sudo venv/bin/python3 main.py 1 1 1` is entered and highlighted with a red box. The terminal background is black, and the text is white.

3.1.1. Command List

Command Name	Description
LED Control	Set LED color and LED pattern to display and activate it.
Control Alarm Pattern	Set the alarm pattern and the number of cycles.
Control Alarm Volume	Set alarm volume and activate it.
Control Alarm Pattern and Volume	Set alarm pattern, number of times, and volume and activate it.
Connection Display Settings	Change the display settings when connecting.
Acquire input status of Touch sensor (only for NE-ST—USB/NE-WT-USB)	Message display the input status of Touch sensor
Reset	Turn off all LED units and stop the alarm.

3.1.2. LED Control

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	1
2	LED Color	Off: 0 Red: 1 Green: 2 Amber: 3 Blue: 4 Purple: 5 Sky Blue: 6 White: 7 No change: 15
3	LED Pattern	Off: 0 Lit: 1 LED pattern 1: 2 LED pattern 2: 3 LED pattern 3: 4 LED pattern 4: 5 LED pattern 5: 6 LED pattern 6: 7 No change: 15

Example: `sudo venv/bin/python3 main.py 1 1 1`

3.1.3. Control Alarm Pattern

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	2
2	Alarm Pattern	Stop: 0 Sounding (Continuous): 1 Sweep sound: 2 Intermittent sound: 3 Weak warning sound: 4 Strong warning sound: 5 Twinkle, Twinkle Little Star: 6 London Bridge: 7 No change: 15
3	Alarm Continuous Operation and Number of Cycles	Continuous operation: 0 Number of cycles: 1 to 14 No change: 15

Example: `sudo venv/bin/python3 main.py 2 1 1`

3.1.4. Control Alarm Volume

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	3
2	Alarm Volume	Mute: 0 Volume: 1-9 Maximum volume: 10 No change: 15

Example: `sudo venv/bin/python3 main.py 3 1`

3.1.5. Control Alarm Pattern and Volume

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	4
2	Alarm Pattern	Stop: 0 Sounding (Continuous): 1 Sweep sound: 2 Intermittent sound: 3 Weak warning sound: 4 Strong warning sound: 5 Twinkle, Twinkle Little Star: 6 London Bridge: 7 No change: 15
3	Alarm Continuous Operation and Number of Cycles	Continuous operation: 0 Number of cycles: 1 to 14 No change: 15
4	Alarm Volume	Mute: 0 Volume: 1-9 Maximum volume: 10 No change: 15

Example: `sudo venv/bin/python3 main.py 4 1 3 5`

3.1.6. Connection display settings

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	5
2	Connection Display Settings	OFF: 0 ON: 1

Example: `sudo venv/bin/python3 main.py 5 0`

3.1.7. Acquire input status of Touch sensor (only for NE-ST-USB/NE-WT-USB)

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	6

Example: `sudo venv/bin/python3 main.py 6`

Output the status to Command Prompt

- When touch sensor input status is OFF: `touch sensor input = OFF`
- When touch sensor input status is ON: `touch sensor input = ON`

3.1.8. Reset

Execute the command with the following command line arguments.

No.	Command Line Arguments	Value
1	Command Identifier	6

Example: `sudo venv/bin/python3 main.py 7`